4.12.11 The Data Acquisition Requests Tool (DART)

A Data Acquisition Request (DAR) is a request for data to be obtained via the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instrument on board the AM-1 spacecraft. The AM-1 satellite and the ASTER instrument platform are tasked by the ASTER Ground Data System (GDS), located in Japan. GDS schedules the ASTER platform based on the DARs received by ASTER users. The ASTER GDS controls scheduling of the ASTER instrument, and provides the collected data as level 1A and level 1B data to the Earth Resources Observation System (EROS) Data Center.

A typical DAR request includes information of the area that is to be imaged, the time range over which images are to be taken, and which of three telescopes that are part of the ASTER instrument platform are to be used in acquiring the image data. In addition, the user request can specify a look angle or a range of look angles at which the image can/should be acquired as well as acceptable sun angles.

The DARTool (DART) provides a graphical user interface (GUI) by which science users submit DARs from the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) client. It is via the DART, an ECS client interface, that scientists in the United States can submit DARs to the ASTER GDS for scheduling.

Table 4.12.11-1. Functions Performed with the Data Acquisition Requests Tool (1 of 2)

User Function	Command/ Script or GUI	Description	When and Why to Use
Viewing the contents of locally stored DAR.	Main DART screen - "Summary" Tab	Displays "nodes" in a tree structure. Each node represents a DAR files stored locally.	To view the contents of DARs that have been saved or sent to ASTER GDS and/or to "load" previously saved DAR work back in the tool to edit or modify it.
Creating or Editing a Data Acquisition request.	Main DART screen - "Create/Edit Request" Tab	Provides the fields in which the user can name the DAR request and set several of the DAR parameters. Also, contains a row of pushbuttons used to launch dialogs and secondary windows in which additional DAR parameters are set.	To fill out required information for a DAR request and to navigate to other portions of the interface which also carry widget controls which allow the user to define required and optional DAR parameters.
Specifying an Area of Interest Polygon for a DAR.	"Spatial Requirements" Secondary Window (launched from pushbutton found on the Main DART screen - "Create/Edit Request" Tab)	Provides an interactive map and text entry whereby the user can specify coordinates to be used in the calculation of the Area of Interest polygon.	To specify the geographically area of which ASTER image data is to be taken.
Specifying the Start and End dates for observations for a given DAR	"Temporal Requirements" Secondary Window (launched from pushbutton found on the Main DART screen - "Create/Edit Request" Tab)	Provides an interactive timeline and text entry whereby the user can specify dates over which image data should be acquired for the DAR.	To specify when ASTER image data should be acquired of a given area.
Specifying "Advanced Viewing Geometry" parameters (specific look angle, look angle range, view swath ID, and/or sun angle range.	"Advanced Viewing Geometry" Dialog (launched from pushbutton found on the Main DART screen - "Create/Edit Request" Tab)	Provides an interface from which look angle and sun angle can be specified for the acquisition of DAR data.	When user has specific look angle, view swath, or lighting requirements for a particular DAR request that cannot be fulfilled by ASTER instrument default settings.

Table 4.12.11-1. Functions Performed with the Data Acquisition Requests Tool (2 of 2)

Specifying "Special Request" parameters (parameters that effect the priority in which a DAR is scheduled or processed).	"Special Request" Dialog (launched from pushbutton found on the Main DART screen - "Create/Edit Request" Tab)	Provides an interface from which the user set parameters that change the priority in which DARs are scheduled or processed.	When user wants to request an increase in priority for the scheduling of a DAR or the processing and shipping of image data collected for the DAR.
Displaying a "Resource Estimate;" an estimate on the number of scenes to be obtained for a given DAR request based on the spatial and temporal data specified by the user.	"Resource Estimate" (launched from pushbutton found on the Main DART screen - "Create/Edit Request" Tab)	Displays the user to view an estimate on the number of scenes to be obtained for a DAR based on the spatial and temporal data specified by the user.	When a user wants an estimate of how many scenes the DAR will generate based on specified spatial and temporal data.
Submitting a DAR to ASTER GDS	Main DART screen - "Create/Edit Request" Tab – "Submit" Button	Pressing the "Submit" button causes all parameters for a DAR to be sent to the DAR Com Gateway which in turn forwards the DAR to ASTER GDS. Upon receipt of a DAR at ASTER GDS, GDS sends a DAR ID back to the user.	When the user has completed all required DAR parameters and as many optional parameters as desired and wants to send the DAR parameters to ASTER GDS in order to obtain image data.
Modifying a DAR that has already been submitted to ASTER GDS.	Main DART screen - "Modify Request" Tab	The user can modify two DAR parameters from this screen provided that the DAR has already been sent to ASTER GDS and a DAR ID has been received.	When a DAR has already been sent to ASTER GDS and the user wishes to change cloud coverage to a less restrictive setting, to suspend an active DAR request or to reactivate a suspended DAR request.
Submitting the a modified DAR to ASTER GDS.	Main DART screen - "Modify Request" Tab	Pressing the "Submit" button causes the modified DAR parameters to be sent to the DAR Com Gateway which in turn forwards the modified DAR to ASTER GDS. Upon receipt of the modified DAR at ASTER GDS, GDS sends a confirmation back to the user.	When a DAR has already been sent to ASTER GDS and the user wishes to change cloud coverage to a less restrictive setting, to suspend an active DAR request or to reactivate a suspended DAR request.

4.12.11.1 Quick Start Using the DART

There are two methods by which the DART can be launched. The first method is by clicking on the DART icon found on the ECS desktop. The other is by executing the ./runDART script from a command line.

It is important to note that launching the DART from the ECS Desktop is preferable to using the script, for the following reason.

When a DAR is submitted to ASTER GDS from the DAR tool a DAR ID is returned and shown to the user in an Information Dialog. When the user presses the "OK" button found on the DAR ID information dialog, this causes a subscription to be sent to the subscription server that allows the user to be notified when the granules for the DAR are ingested into ECS via email. The subscription server gets the user's email address from the ECS Desktop. If the user is not logged into and using the ECS desktop, the email address cannot be sent to the subscription server. The DAR will be scheduled and fulfilled, but the user will not be notified of the arrival of the corresponding granules.

4.12.11.1.1 Invoking the DART from the Command Line Interface

To launch the DART via script, the user must perform the following steps:

dce_login <dce user name>

<dce password>

./runDART <ECS_HOME> <ECS_MODE> <ECS_USERID>

The parameters used above are:

<dce user name> is the user's ECS DCE user name to log on for ECS connection.

<dce password> is the user's ECS DCE password with the user name to log on for ECS connection.

<ECS_HOME> is the user's ECS home directory (~home)..

<ECS_MODE> is the MODE of operation the DART is to run under (usually OPS)

<ECS_USERID> the user's ECS userid for access to the ECS system.

See Appendix C, List of Scripts and Macros, for a listing of the ./runDART script.

4.12.11.1.2 Invoking the DART from the ECS Desktop

To launch the DART from the ECS Desktop, the user should click on the DART icon found on the ECS Desktop.

Figure 4.12.11-1. DART Icon

4.12.11.2 The DART Main Screen

The main screen of DART uses tabs as its primary navigation tool. There are three tabs on the main window of the DART. One tab is called "Summary" and allows the user to view a condensed presentation of xAR work, query parameters, and the returned results of submitted xAR request that are stored locally (on a hard drive or LAN). As the name suggests, the second tab, called "Create/Edit Requests" possesses the functionality necessary to create a new xAR request or to edit the parameter of a previous xAR Request that is locally stored. The third tab, called "Modify Request" will possess the functionality to modify certain attributes of a DAR that has already been submitted to ASTER GDS.

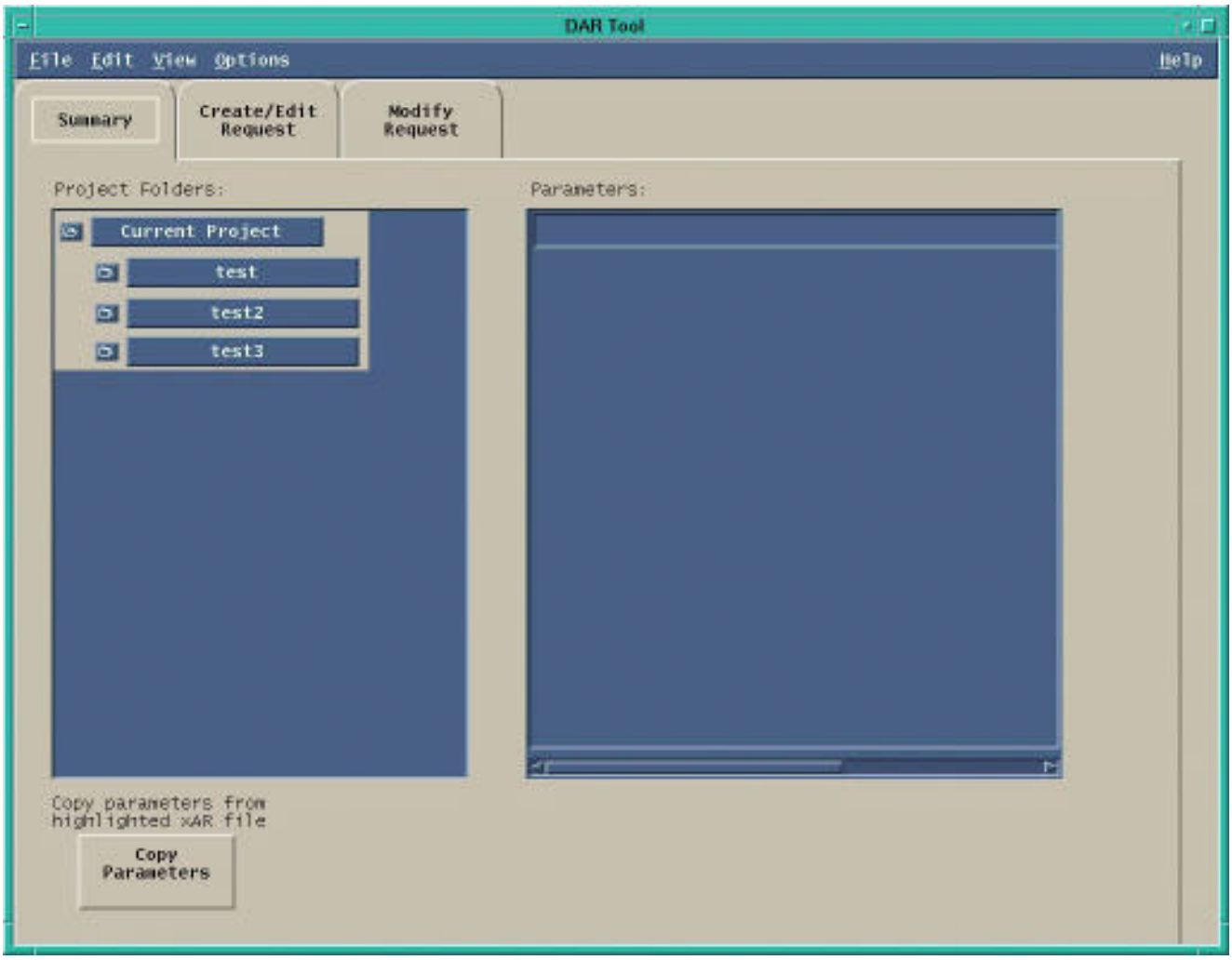

Figure 4.12.11-2. The DART Main Screen showing the Summary Tab

4.12.11.2.1 The Summary Tab

When the DART is initially launched from the desktop, the DART tool opens with the first tab, called "Summary". The Dart main screen with the default Summary tab is shown in Figure 4.12.11-2. There are two main functional areas on this tab: the “Project Folders” area (on the left) and the “Parameters” area (on the right).

The Project Folders area is intended to behave in a fashion similar to a file manager. In this area, DARs that are locally stored (on a hard drive or LAN) are displayed by name in a Project Folder “tree.” This includes DAR requests upon which a user is still working and the parameters of DARs that have been successfully sent to GDS for which a DAR ID has been returned. It is intended that when a user selects a node for a particular DAR in the Project folder area, that all

the information that has been saved for that DAR is displayed in the “Parameters” area, which is found to adjacent, to the right of the Project Folders area.

If the user wishes to edit the contents of a DAR stored locally (i.e.: finish an incomplete DAR that was saved or edit a previous DAR for which the parameters had been saved), the user can select the desired item from the Project Folders list by clicking on it and then depress the pushbutton below the Project Folders area that is labeled ”Copy Parameters.” The action will cause all parameters stored for the highlighted item to populate the appropriate fields in the "Create/Edit Request" functional group where the user can inspect and/or edit them.

4.12.11.2.2 Create/Edit Request Tab

From the "Create/Edit Request" tab, the user has access to all fields necessary or desirable to complete a DAR request or to edit existing xAR parameters. There are three "screens" through which a user must navigate in order to create or edit a xAR request. In addition, there are several additional functions available via popup windows.

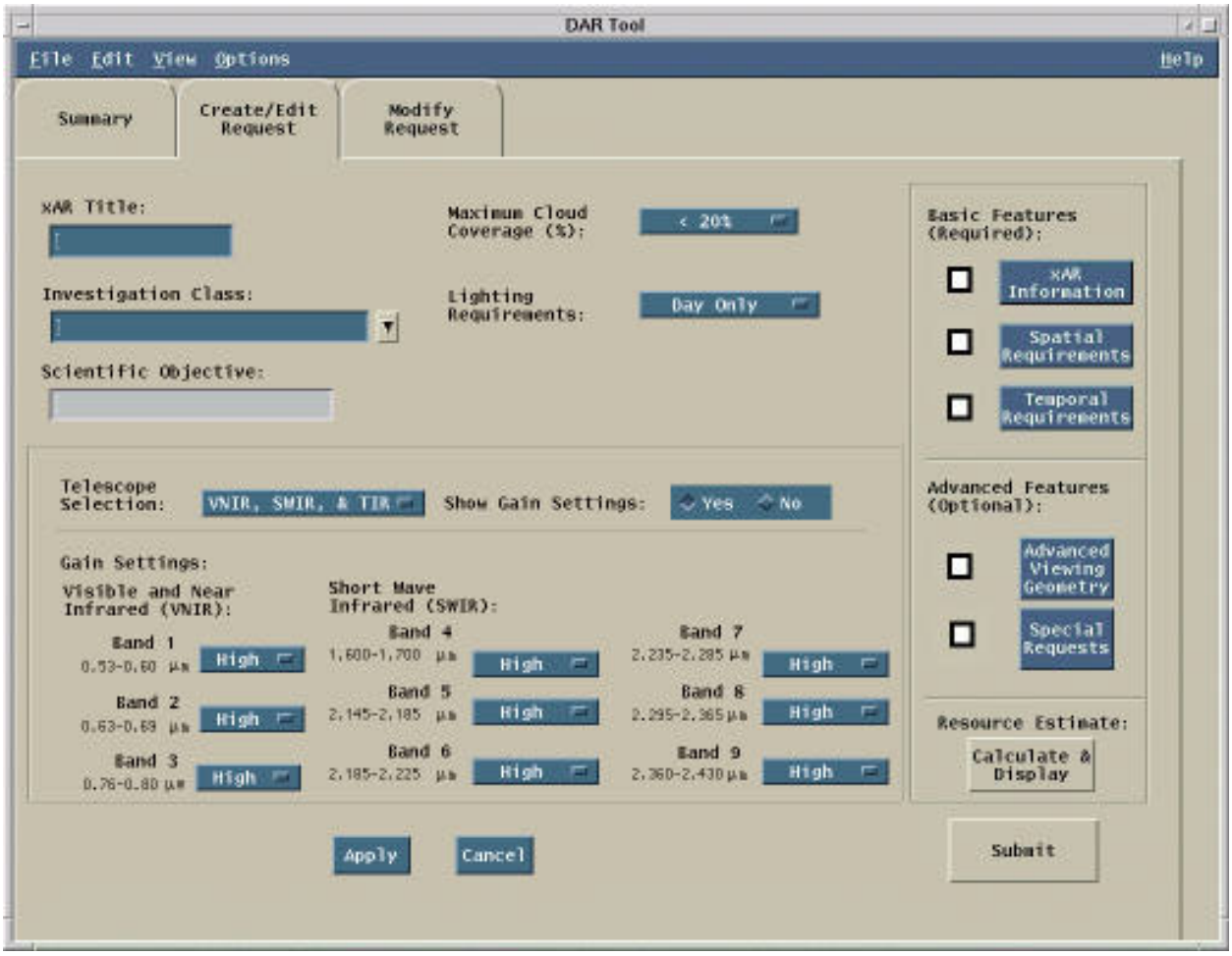

Figure 4.12.11-3. The DART Create/Edit Request Tab

xAR Information

The first "screen" the user must visit is the “xAR Information” area (upper left) of the contents of the "Create/Edit Request" tab. This area contains many of the elements necessary to create or edit a DAR request, including: xAR Title, Investigation Class, Scientific Objective, Cloud Coverage, Lighting Requirements, Telescope Selection, and Telescope Gain Settings. The fields displayed in this area are described in Table 4.12.11-2 below.

The Create/Edit Request Tab also has a series of buttons to activate secondary windows in which spatial requirements and temporal requirements (the second and third required screens) for the DAR are defined as well as other advanced user options which allow the user to identify look and sun angles for the DAR or change settings which effect the priority in which the DAR is scheduled or processed. A check box has been placed to the left of each pushbutton that launches one of these secondary windows. This was done to provide a visual reference for users indicating which screens they have visited and to which they have saved entries or changes. It is intended to function such that when a user visits a secondary window; makes an entry; and “applies” them, a check mark appears in the checkbox next to the corresponding pushbutton.

The functions available through these buttons are:

- **xAR Information** is the default “screen area” occupying the upper left of the Create/Edit Request Tab.
- **Spatial Requirements l**aunches Spatial Requirements pop-up.
- **Temporal Requirements** launches Temporal Requirements pop-up.
- **Advanced Viewing Geometry** launches Advanced Viewing Geometry pop-up.
- **Special Requests** launches Special Request pop-up.
- **Calculate & Display** calculates an approximate number of scenes to be acquired to fulfill the DAR based on spatial and temporal data provided by the user
- **Submit button s**ends DAR data to ASTER GDS to be scheduled.

Finally, there is a button labeled "**Submit**" in the lower right-hand corner of the "Create/Edit" tab. When the user has supplied all the DAR parameters to be input, the "Submit" buttons is pressed to send the DAR to GDS.

Table 4.12.11-2. xAR Information Field Descriptions

Field Name	Data Type	Size	Entry	Description
xAR Title	character	32	Optional	Allows user to name DAR
Investigation Class	character	1	Optional	User enters the scientific discipline that DAR request is supporting.
Scientific Objective	character	32	Optional	Brief description of the purpose of the study.
Cloud Coverage	character	1	Optional	Allows user to specify the maximum amount of cloud coverage (% , 0-100) acceptable for a image data acquired
Lighting Requirements	character	1	Optional	Allows user to specify whether image data should be acquired at day or night (or both).
Telescope Selection	character	1	Optional	User can choose from three ASTER telescopes, alone or in combination, to acquire image data.
Show Gain Settings	N/A	N/A	Optional	Gives user the option to see the "gain setting" controls on the xAR Information interface.
Band 1	character	1	Optional	Allows user to request a gain setting resolution for band 1 of VNIR telescope during image acquisition.
Band 2	character	1	Optional	Allows user to request a gain setting resolution for band 2 of VNIR telescope during image acquisition.
Band 3	character	1	Optional	Allows user to request a gain setting resolution for band 3 of VNIR telescope during image acquisition.
Band 4	character	1	Optional	Allows user to request a gain setting resolution for band 4 of SWIR telescope during image acquisition.
Band 5	character	1	Optional	Allows user to request a gain setting resolution for band 5 of SWIR telescope during image acquisition.
Band 6	character	1	Optional	Allows user to request a gain setting resolution for band 6 of SWIR telescope during image acquisition.
Band 7	character	1	Optional	Allows user to request a gain setting resolution for band 7 of SWIR telescope during image acquisition.
Band 8	character	1	Optional	Allows user to request a gain setting resolution for band 8 of SWIR telescope during image acquisition.
Band 9	character	1	Optional	Allows user to request a gain setting resolution for band 9 of SWIR telescope during image acquisition.
Resource Estimate	N/A	N/A	Optional	Calculates an approximate number of scenes to be acquired to fulfill the DAR based on spatial and temporal data provided by the user.

4.12.11.2.2.1 Spatial Requirements Pop-up

The Spatial Requirements Screen, displayed in a secondary window and launched by a pushbutton on the DART main window, allows the user to define an Area of Interest (AOI) and specify coverage criteria such as sampling, cross track fragmentation and area of interest duration for the query. The "Spatial Requirements" screen makes use of the tabs to organize a variety of functions related to the map display in a way that is logical and that keeps them in close proximity to the map display. The functional organization includes three tabs; one for "Pan and Zoom," one called "Map Display Controls" and a third tab called "Coverage Details."

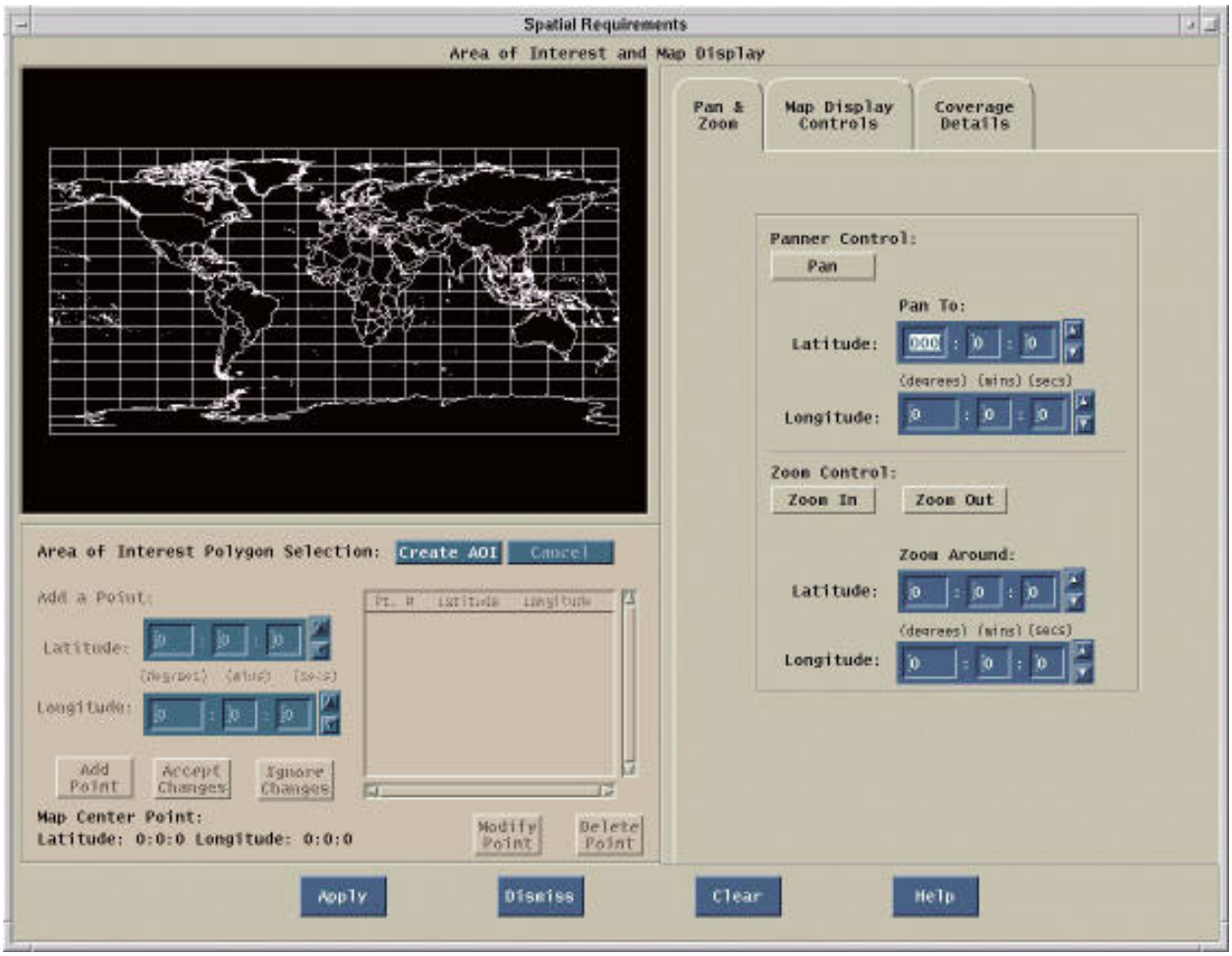

Figure 4.12.11-4. The Spatial Requirements Pop-up showing the Area of Interest Polygon Selection and the Pan and Zoom subtab.

Area of Interest Polygon

Immediately below the map display is an area labeled "Area of Interest Polygon Selection." This area provides the text entry and modification of points in the AOI polygon. Most of these

controls are desensitized except for a pushbutton labeled "**Create AOI**" (Note: at the completion of the AOI creation process this pushbutton displays "**Finished AOI**"). When the "**Create AOI**" pushbutton is depressed, the other "Area of Interest Polygon Selection" buttons become sensitized and the map display area enters the polygon selection mode. In this state, an AOI polygon can be defined by one of two mechanisms: mouse operations or text entry. After "**Create AOI**" has been depressed, it is intended that the user move the mouse over the map display and click the first mouse button to place a point of the AOI polygon. In this manner, the user can continue to place points and after each point is placed the polygon should be redrawn upon the map. Also, the coordinates for each point placed by the mouse operation should appear in the extended list widget in the "Area of Interest Polygon Selection" section. The other way to enter points in the AOI polygon is to enter the latitude and longitude of the point (if the coordinates are known) in the text fields provided and than depress the button labeled "**Add Point**." The AOI polygon is limited to 50 points. It is intended that users will also have the ability to edit or delete AOI points. To edit a point, the user should be able to highlight the coordinates for the point entry in the extended list widget and depress the button labeled "**Modify Point**." This action will result in the latitude and longitude text fields becoming repopulated with the coordinate data that was entered. At this point the user can modify the entry in the appropriate text fields and depress the "**accept changes**" or "**ignore changes**" button to either apply or reject the edit action. To delete a point, the user should be able to select a point in the extended list and press the "**delete point**" entry. This should remove the point from the list and cause the AOI polygon to be redrawn on the map without the deleted point.

The functions available through the Create AOI buttons are:

- **Create AOI** – Pressing this button changes the state of the map from a "pan & zoom" state to a state in that points can be entered.
- **Cancel** – Resets map.
- **Add Point** – This causes any coordinate data entered into the latitude and longitude text entry fields to be added to the list of AOI polygon points and to be drawn on the map.
- **Accept Changes** – When a point is being modified by the user and the new coordinates have been entered into the latitude and longitude text entry fields, this button causes the new coordinates to replace the coordinates for the point in question.
- **Ignores Changes** – When a point is being modified by the user and the new coordinates have been entered into the latitude and longitude text entry fields, this button causes the new coordinates entered by the user to be ignored and to restore the original data point.
- **Modify Point** – When a point is highlighted by the user in the "point list," pressing this button causes the coordinates to be populated into the latitude and longitude text entry fields where the user can change them
- **Delete Point** – When a point is highlighted by the user in the "point list," pressing this button causes the point to be deleted.

The entry of Area of Interest Polygon points is required in order to create and submit a valid DAR request (see fields marked "*" in Table 4.12.11-3). However, the user has the option to enter these points either through the latitude and longitude text entry fields or through direct interaction with the map or a combination of both.

Table 4.12.11.3. Spatial Requirements -"Create AOI" Field Description

Field Name	Data Type	Size	Entry	Description
Latitude	Character	7	Required*	Allows user to the latitude of an AOI point via text entry.
Longitude	Character	8	Required*	Allows user to the longitude of an AOI point via text entry.
Map	N/A	N/A	Required*	This is an interactive map that allows users to create and display an Area or Interest polygon.
Point List	N/A	N/A	N/A	Displays a list of AOI points that have been entered either through keyboard entry or by interaction with the map.

Pan & Zoom subTab

It is intended that the user have the capability of panning and zooming on the map display via mouse or key board operation. Both methods are described here and both require that the tab be set to the "Pan & Zoom" tab.

The functions available through the Pan & Zoom subTab buttons are:

- **Pan** – Resets the center of the map so a different map area is displayed with a new center point based determined by the user.
- **Zoom In** – Resets the map scale to show more detail (less area) by a pre-determined increment on a coordinate point that is specified by the user..
- **Zoom Out** – Resets the map scale to show a wider area (less detail) by a pre-determined increment on a coordinate point that is specified by the user.

Pan

To pan the map via mouse, the user should click on the "Pan" button, found on the "Pan & Zoom" tab. The user should then click on the map. The point the user clicks on becomes the new "center" of the map as the map is redrawn.

To pan the map via keyboard operation, the user should add in the coordinate entry field labeled "Pan to:" the coordinate which the user intends to be at the center of the map as it is drawn on the interface. When the user is finished entering the coordinates, depressing the "pan" button causes the map to be redrawn using the coordinates supplied by the user as the map center.

Zoom

To zoom in on the map via mouse, the user should have the user should click on the “Zoom In” button, found on the “Pan & Zoom” tab. The user should then click on the map. The point the user clicks on becomes the new “center” of the map as the map is redrawn to a scale increment that is determined by the tool.

To zoom out on the map via mouse, the user should have the user should click on the “Zoom Out” button, found on the “Pan & Zoom” tab. The user should then click on the map. The point the user clicks on becomes the new “center” of the map as the map is redrawn to a scale increment that is determined by the tool.

To zoom in on the map via keyboard operation, the user should add in the coordinate entry field labeled “Zoom Around:” the coordinate which the user intends to be at the center of the map as it is drawn on the interface. When the user is finished entering the coordinates, depressing the “Zoom in” button causes the map to be redrawn using the coordinates supplied by the user as the map center as the map is redrawn to a scale increment that is determined by the tool.

To zoom out on the map via keyboard operation, the user should add in the coordinate entry field labeled “Zoom Around:” the coordinate which the user intends to be at the center of the map as it is drawn on the interface. When the user is finished entering the coordinates, depressing the “Zoom out” button causes the map to be redrawn using the coordinates supplied by the user as the map center as the map is redrawn to a scale increment that is determined by the tool.

Table 4.12.11-4. Spatial Requirements - Pan & Zoom Field Description

Field Name	Data Type	Size	Entry	Description
Latitude	Character	7	Optional	Allows user to specify via text entry the latitude in which the map should be panned.
Longitude	Character	8	Optional	Allows user to specify via text entry the longitude in which the map should be panned.
Latitude	Character	7	Optional	Allows user to specify via text entry the latitude in which the map should be zoomed.
Longitude	Character	8	Optional	Allows user to specify via text entry the longitude in which the map should be zoomed.

Map Display Controls

The second tab of three on the Spatial Requirements Tab is called "Map Display Controls." As stated before, the design illustrated here is subject to change based upon the capabilities of the mapping tool that this screen will use. This tab provides the controls responsible for the all aspects of the map display. This includes the type of map, its resolution quality, and the

projection of map overlays (such as rivers, borders, etc.). This also includes views of the ASTER satellite's ground track and swath views over a given period of time that can be specified by the user.

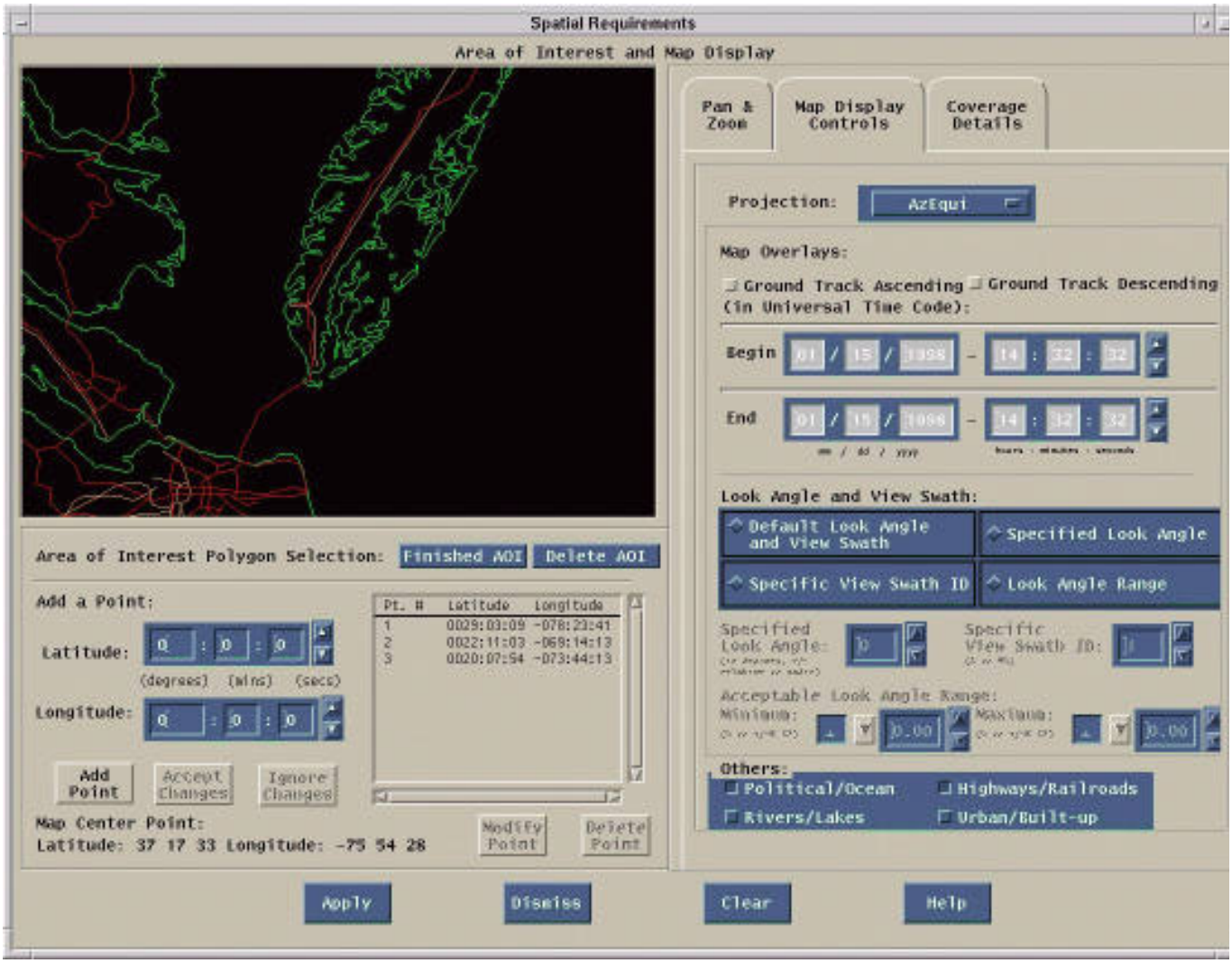

Figure 4.12.11-5. The Spatial Requirements Pop-up showing the Map Display Controls tab

The functions available through the Map Display Controls buttons are:

- **Projection** – Used to select type of map to be shown in the map display.
- **Ground Track Ascending** – Allows the user to have the ascending portion of the satellite ground track displayed on the map.

- **Ground Track Descending** – Allows the user to have the descending portion of the satellite ground track displayed on the map.
- **Look Angle and View Swath** – Allows user to select look angles and/or view swaths to be displayed as on overview on the map given a begin and end date.
- **Default Look Angle and View Swath** – Allows the default look angle and view swath to be displayed on the map given a begin and end date.
- **Other** – Allows user to select other overlays to be displayed on the map.
- **Political/Ocean** – Toggles on and off the display of overlays with political and ocean boundaries.
- **Highway/Railroad** – Toggles on and off the display of overlays of highways and railroads.
- **Rivers/Lakes** – Toggles on and off the display of overlays or rivers and lakes.
- **Urban/Built-up** – Toggles on and off the display of overlays with urban and other high-population density areas.

Table 4.12.11-5. Spatial Requirements - Map Display Controls Field Descriptions

Field Name	Data Type	Size	Entry	Description
Begin	Character	N/A	Optional	Allows the user to define the begin date and time for the portion of the ground track to be displayed on the map.
End"	Character	N/A	Optional	Allows the user to define the end date for the portion of the ground track to be displayed on the map.
Specified Look Angle	Character	N/A	Optional	Allows the user to specify a look angle to be displayed on the map given a begin and end date.
Specified View Swath ID	Character	N/A	Optional	Allows the user to specify a pre-determined view swath to be displayed on the map given a begin and end date.
Look Angle Range	Character	N/A	Optional	Allows the user to specify a look angle range to be drawn onto the map given a begin and end date.

Coverage Details

The third tab of three on the Spatial Requirements Tab is called "Coverage Details." Primarily, this tab possesses the controls responsible for selecting coverage method (normal or sampled), specifying whether full duration AOI is required (yes or no), and specifying cross-track fragmentation (yes or no). If, for "coverage method," "normal" is selected, than the controls used

to set the sampling parameters (minimum sampled length, maximum sampled length, number of samples, and coverage amount) should be desensitized (greyed-out). Even though "Coverage Amount" is desensitized, it should show a value of 100%. If "sampled" is selected for "coverage method," this interface sensitizes the controls used to set the sampling parameters (minimum sampled length, maximum sampled length, number of samples, and coverage amount) and the user can set these parameters.

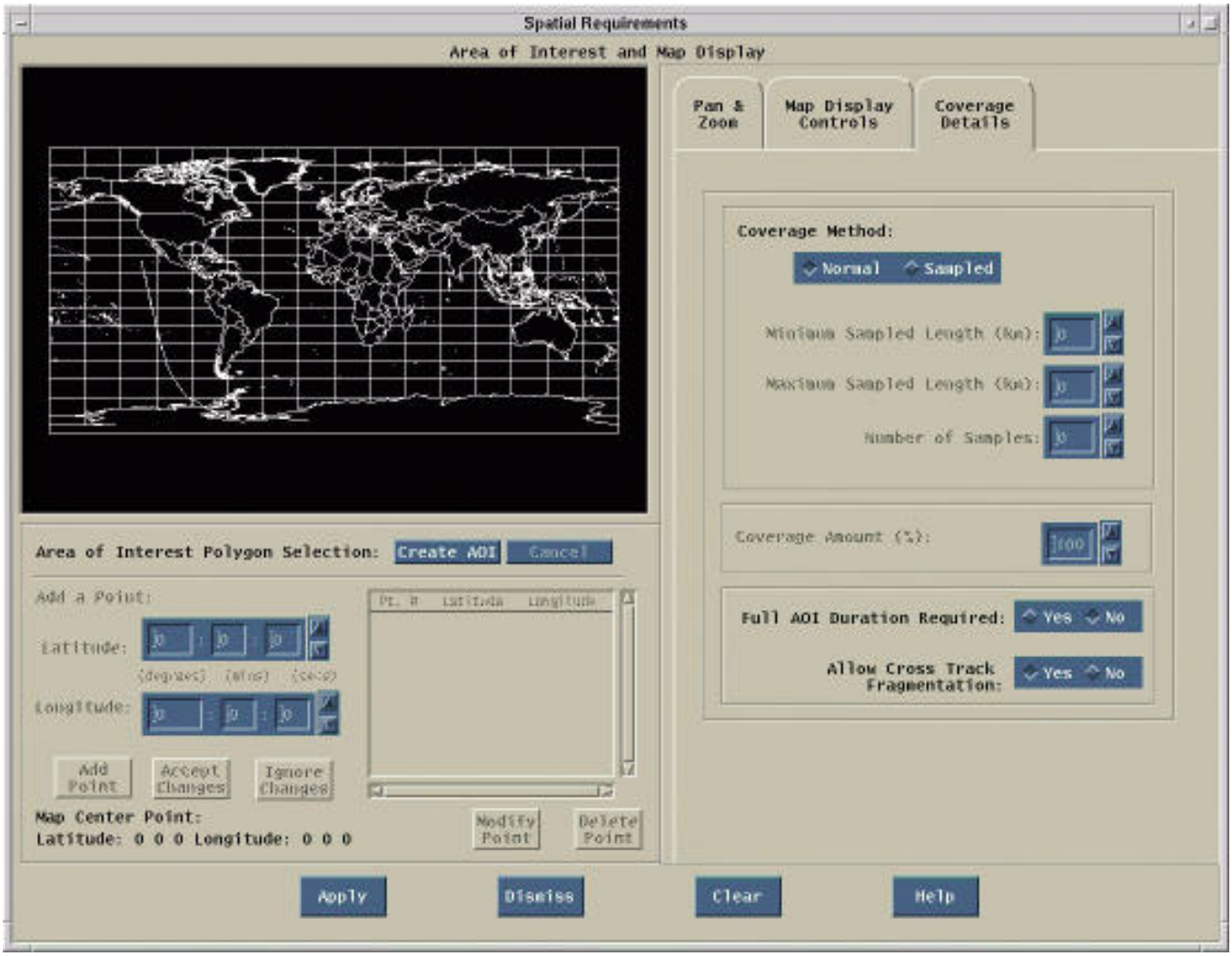

Figure 4.12.11-6. The Spatial Requirements Pop-up showing the "Coverage Details" tab.

The functions available through the Coverage Details buttons are:

- **Coverage Methods** – Allows user to choose between "Normal" and "Sampled" coverage of the AOI

- **Normal** <default> – User specifies that 100% of the AOI area is to be imaged.
- **Sampled** – This sensitizes the controls that allow the user to specify sampling parameters
- **Full AOI Duration Required** – The user specifies whether or not the full AOI duration is required.
- **Allow Cross Track Fragmentation** – The user specifies whether or not cross track fragmentation is allowed.

When the AOI is selected and all the desired parameters set, the user than depresses the "Apply" button to accept the settings. When "Apply" is pressed, the check box beside the "Spatial Requirements" push button on the "Create/Edit Request" tab becomes checked-off and the user-specified spatial requirements are applied.

Table 4.12.11-6. Spatial Requirements - Coverage Details Field Descriptions

Field Name	Data Type	Size	Entry	Description
Minimum sample length.	Character	2	Optional	User specifies the minimum acceptable number of consecutive scenes in a continuous "ribbon" of scenes taken from the AOI.
Maximum sample length.	Character	2	Optional	User specifies the maximum number of consecutive scenes in a continuous "ribbon" of scenes taken from the AOI.
Number of samples	Character	2	Optional	User specifies the number of samples to be taken from a defined area.
Coverage Amount	Character	3	Optional	The user specifies the minimum acceptable percentage of the AOI to be sampled.

Temporal Requirements Pop-up

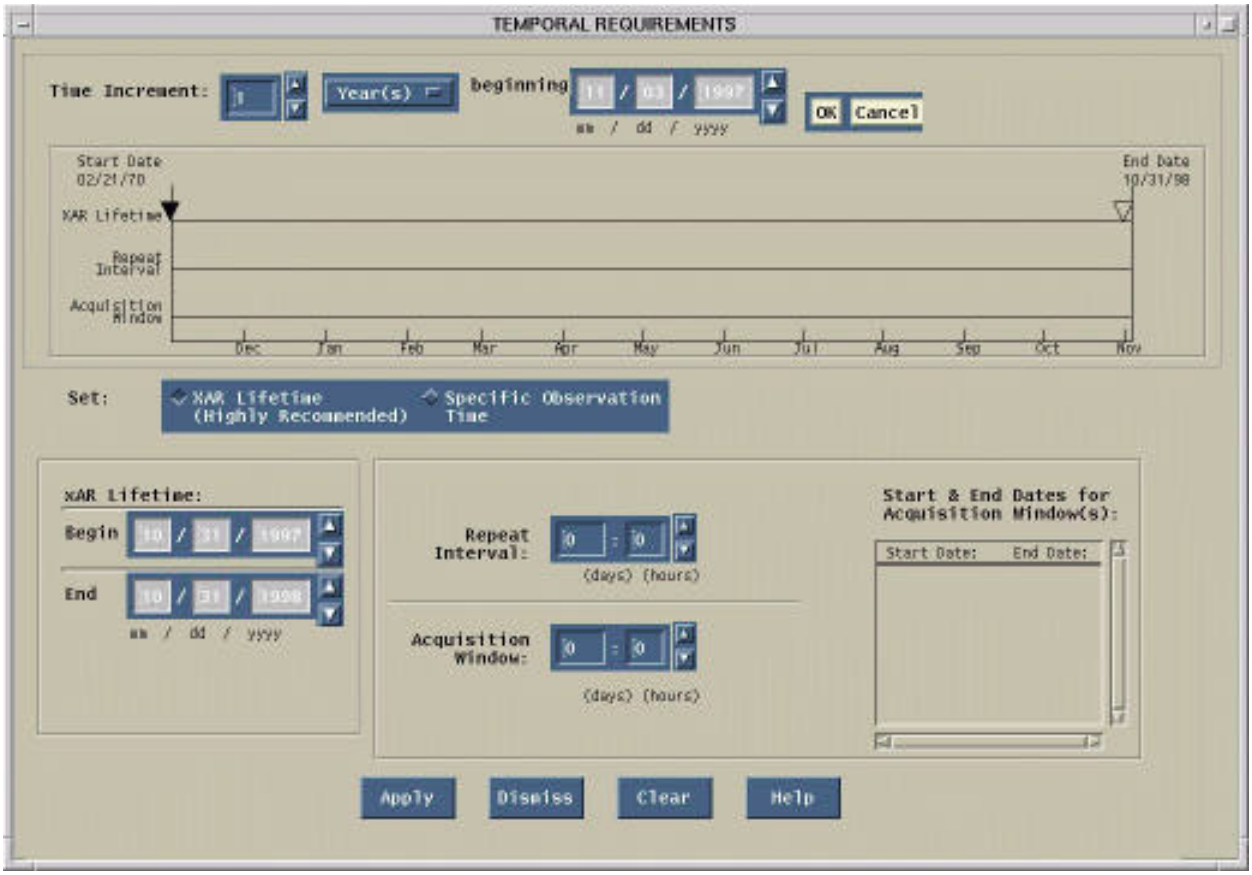

Figure 4.12.11-7. The Temporal Requirements Pop-up (default)

The Temporal Requirements Pop-up (launched by a pushbutton on the Create/Edit Request Tab) is provided so that a user can specify the time (in days) that the Area of Interest described in a DAR request are to be observed. Also, a user can requests multiple observations at regularly scheduled intervals in a single DAR request This window is designed to allow user to enter temporal information textually or graphically.

The functions available through the Temporal Requirements buttons are:

- **Time Increment options** – Allows user to specify unit of time (months or years) to be displayed on time line.
- **Time line** – Interactive time line that allows user to set and also displays the temporal requirements of the DAR.

- **Set** – Allows user to choose between setting an observation time window or a single observation time.
- **Start and End Dates for Acquisition Window(s)** – Displays start and end dates for acquisition windows that result from Repeat Interval and Acquisition Window settings.
- **Apply –** Apply the changes made to the DAR display.
- **Dismiss –** Dismiss or ignoree the changes made to the DAR display
- **Clear –** Clear the fields on the DAR display.
- **Help –** Display a Help dialog explaining fields and buttons on the screen.

xAR Lifetime

This area of the screen is used to select the times at which observations for a specific DAR are to occur. For most observations, a user must set the "xAR Lifetime. The "xAR Lifetime" is the basic unit of time for a DAR request. Simply stated, the user enters the date on which observations are requested to start and the date on which they are requested to end.

The user can either enter the xAR Lifetime start and endpoints via mouse interacting with the timeline widget directly or by entering the start and end dates into the appropriate text fields, which in turn, update the timeline display.

Multiple Observations

In some instances, it may be desirable for a user to request multiple observations of the same Area of Interest at regularly scheduled intervals rather than a steady stream of data during the entire xAR lifetime. If the user decides that it is not necessary to have a steady stream of data about a particular AOI, but wants image data from the same AOI at regular time intervals, then the user can choose the option to request multiple observations of the AOI. To set request multiple observations, the user must set two parameters, "Repeat Interval" and "Acquisition Window." Both are interdependent and both must be set in order to create multiple observations. The "Repeat Interval," expressed in terms of days and hours, is the amount of time separating the start of each desired observation. The "Acquisition Window," also expressed in days and hours, refers to the duration of each Repeat Interval. Like the xAR Lifetime, the Repeat Interval, & Acquisition Window both graphically via mouse operation and textually via keyboard operation.

Table 4.12.11-7. Temporal Requirements Field Descriptions

Field Name	Data Type	Size	Entry	Description
Time Increment text field	Character	2	Optional	Allows user to specify number of units of time to be displayed on time line.
"beginning" text field	character	8	Optional	Allows user to specify the beginning data for the time increment to be displayed on the time line.
xAR Lifetime Begin Text field	Character	9	*Required	User enters the beginning date from which images should be taken in support of DAR.
xAR Lifetime End Text field	Character	9	*Required	User enters the end date at which image acquisition should terminate for the DAR.
Repeat Interval	Character	5	Optional	Allows user to set the time between recurring acquisitions in a single DAR.
Acquisition Window	Character	5	Optional	Allows user to set the duration of recurring acquisition windows in a single DAR.

- The xAR Lifetime begin and end date are mandatory but can be set either with the text entry widgets or the time line or both.

Specific Observation Time

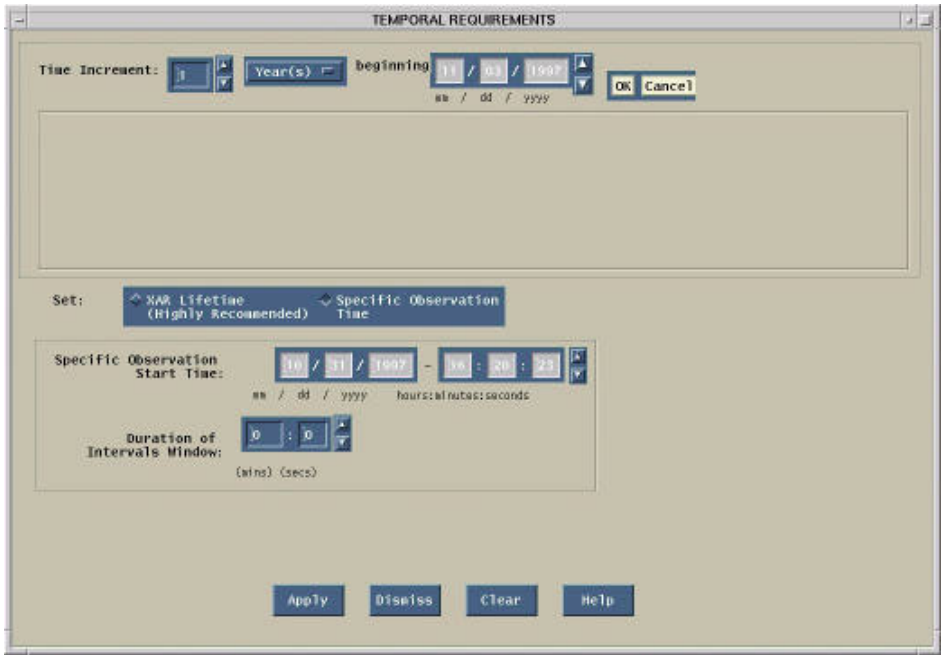

Figure 4.12.11-8. The Temporal Requirements Pop-up as it appears when setting a "Specific Observation Time."

In a few instances, it may be desirable for the user to select a "Specific Observation Time." The "Specific Observation Time" option is not to be used often and its use is constrained in terms of both time and space If a user selects this option, a specific day and time must be provided as well as the duration of time that ASTER instruments are to be left on. Day & time must be specified with precision to the second and duration is expressed in minutes and second. Due to limitations of satellite hardware, the duration of a specific observation cannot exceed 16 minutes per orbit. Also, if a user does enter a Specific Observation Time, any AOI data entered by the user is disregarded as the ASTER instruments can only image what is directly beneath the satellite at the specified time.

To set a "Specific Observation Time," the user must select the radio button labeled "Specific Observation Time." This radio button is found immediately below the "temporal widget." Once the "Specific Observation Time" selected, the "temporal widget" & "time increment" controls are desensitized. Also, the text fields to set xAR Lifetime, Repeat Interval, and Acquisition Window are replaced with text fields to set the start time and duration of the Specific Observation Time. Specific Observation Time can only be set with these text controls. No graphical input is possible.

Table 4.12.11-8. Temporal Requirements - Specific Observation Time Field Descriptions

Field Name	Data Type	Size	Entry	Description
Specific Observation Start Date/Time	Character	14	*Required	To set a specific date and time for DAR data acquisitions.
Duration of Intervals Window	Character	4	*Required	Allows user to specify a duration of the specific observation period (not to exceed 16 minutes).

- If Specific Observation Time is selected, a date, time, and duration entry are required. If Multiple Observations are selected, then it is necessary to set a xAR Lifetime, but the user should not a specific observation time.

Advanced Viewing Geometry

This option is available as a dialog enabled by a pushbutton located on the Create/Edit Request Tab for users who would like to specify acceptable look angles, sun angles, and/or view swaths for a given DAR request. To access any or all of these options, the user can press the "Advanced Viewing Geometry" pushbutton found on the Create/Edit Request Tab. That actions spawns an Advanced Viewing Geometry popup containing look angle, sun angle, and view swaths options.

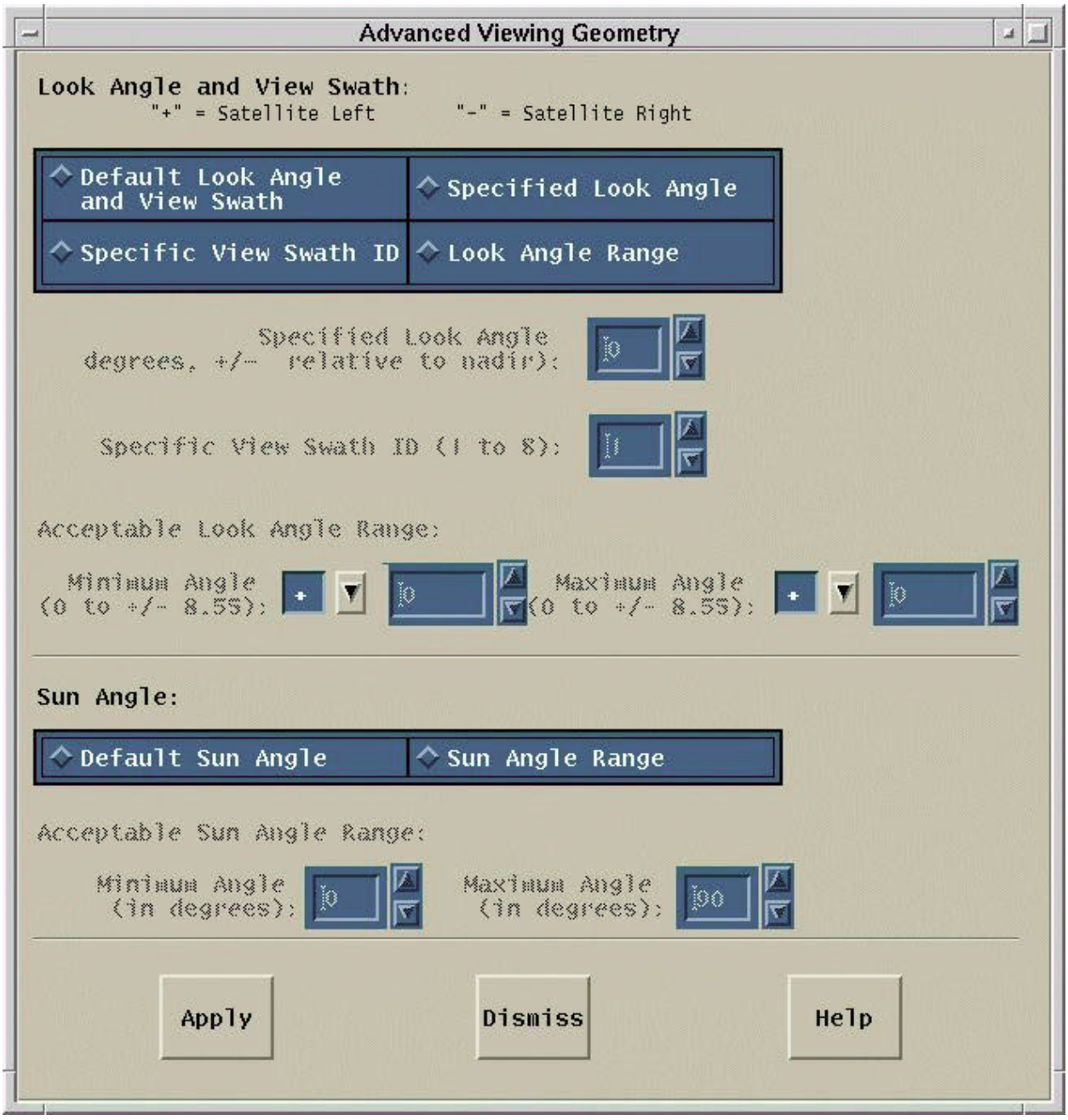

Figure 4.12.11-9. The Advanced Viewing Geometry Pop-up.

For look angle, the use can select a specific look angle, specify a range of valid look angles, use a pre-determined look angle "ID" to set a look angle, or choose to use the default look angle setting. For the Sun Angle, the user can select the option to specify a range of valid look angles or to a the default look angle setting.

The functions available through the Temporal Requirements buttons are:

- **Look Angle and View Swath** – Allows user to pick default look angles and view swaths, a specific look angle, a look angle range, or a view swath ID.
- **Default Look Angle and View Swath** – Allows user to specify to ASTER GDS that default look angle and view swath settings should be used for the ASTER platform in the acquisition of image data to fulfill the DAR.
- **Sun Angle** – Allows user to pick decide between using default sun angle settings or setting acceptable sun angles for the DAR.
- **Default Sun Angle** – Allows user to specify to ASTER GDS that default sun angles should be used for the ASTER platform in the acquisition of image data to fulfill the DAR.
- **Apply –** Apply the changes made to the DAR display.
- **Dismiss –** Dismiss or ignoree the changes made to the DAR display
- **Help –** Display a Help dialog explaining fields and buttons on the screen.

Table 4.12.11-9. Advanced Viewing Geometry Field Descriptions

Field Name	Data Type	Size	Entry	Description
Specified Look Angle	Character	1	Optional	Allows user to specify to ASTER GDS a single look angle setting for the ASTER platform in the acquisition of image data to fulfill the DAR.
Specified View Swath ID	Character	1	Optional	Allows user to specify to ASTER GDS a single view swath (from a list of predetermined view swaths, each given its own identification number) setting for the ASTER platform in the acquisition of image data to fulfill the DAR.
Minimum Look Angle Range	Character	4	Optional	Allows user to specify to ASTER GDS the minimum acceptable look angle for a rang or look angles for the ASTER platform in the acquisition of image data to fulfill the DAR.
Maximum Look Angle Range	Character	4	Optional	Allows user to specify to ASTER GDS the minimum acceptable look angle for a rang or look angles for the ASTER platform in the acquisition of image data to fulfill the DAR.
Minimum Sun Angle Range	Character	2	Optional	Allows user to specify to ASTER GDS the minimum acceptable look angle for a rang or look angles for the ASTER platform in the acquisition of image data to fulfill the DAR.
Maximum Sun Angle Range	Character	2	Optional	Allows user to specify to ASTER GDS the minimum acceptable look angle for a rang or look angles for the ASTER platform in the acquisition of image data to fulfill the DAR.

Special Requests

"Special Requests" refers to a dialog that is enabled by a pushbutton located on the Create/Edit Request Tab that allows the user to specify conditions that effect the priority in which the DAR is given during scheduling and processing. The "Special Requests" dialog provides uses the opportunity to indicate to ASTER GDS whether the DAR being requested is coincident with research being conducted on the ground, the urgency of the request, or the necessity for expidited processing if requested.

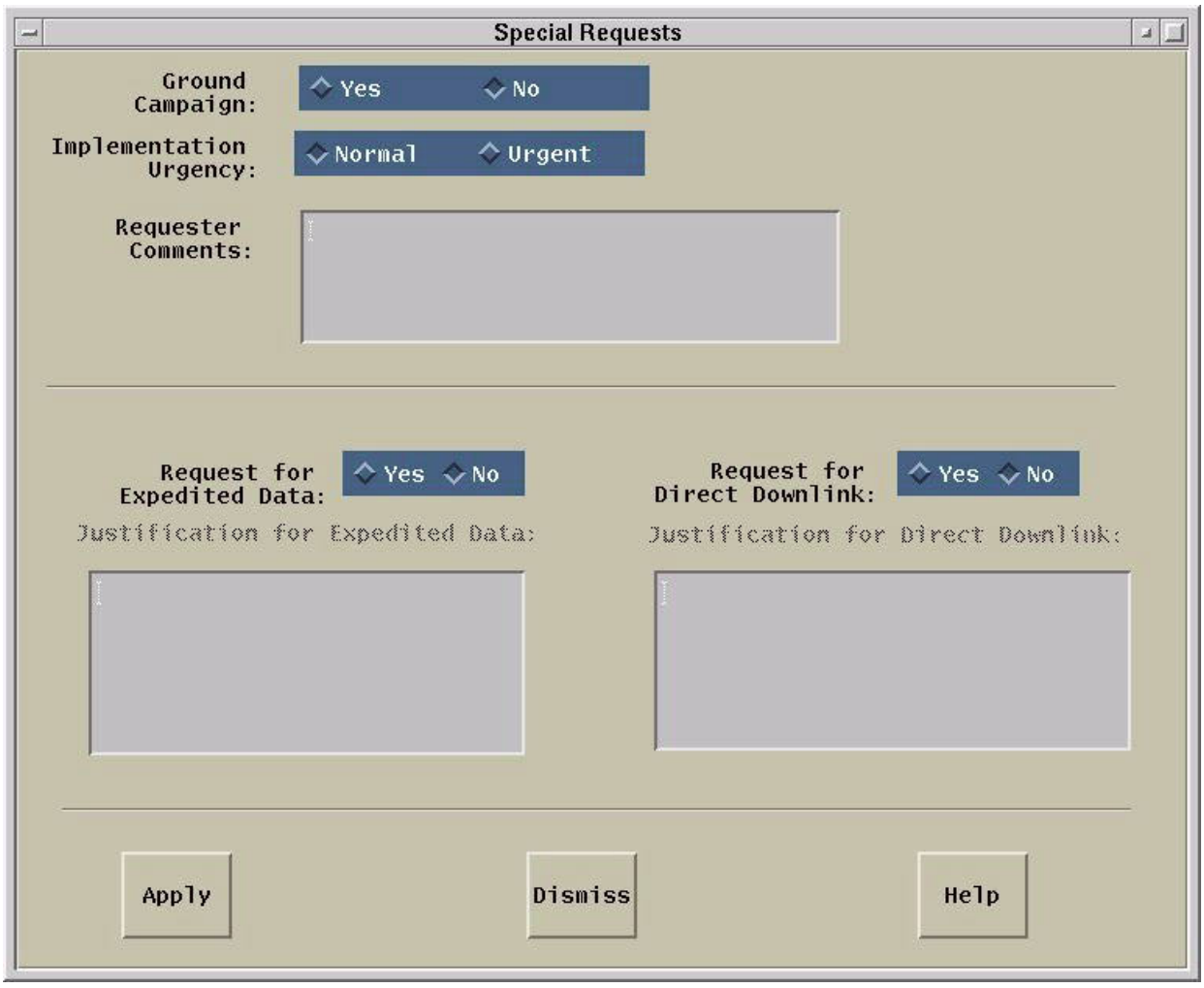

Figure 4.12.11-10. The Special Requests Pop-up.

One of the choices on this popup, Implementation Urgency, allows the user to choose between "normal" and "urgent" priority. The default setting is "normal." At the suggestion of ASTER science team, the interface is being design so that if the user selects "Urgent" for this choice, than the xAR Lifetime must be set to begin and end within 18 days following the request. Any request in which the xAR lifetime exceeds 18 days cannot be flagged urgent. Conversely, if a request is flagged urgent prior to setting Temporal Requirements and the user attempts to an enter a xAR lifetime end time that exceeds18 days (following the day the request is being submitted), the software will not allow the entry. The 18 day figure was derived based on the 16 day spacecraft cycle + two days for processing delays and that information that could be obtained after one 16 day cycle of the satellite should not be deemed urgent. This implementation is intended to prevent abuses of the Urgency setting.

The functions available through the Special Requests buttons are:

- **Ground Campaign** – Indicates to ASTER GDS whether the temporal requirements for this DAR are coincident with supporting research being conducted on the ground. When set to "yes," this raises the scheduling priority for the DAR.
- **Implementation Urgency** – Indicates an urgent request to ASTER GDS. When this option is set to "yes," the xAR Lifetime cannot exceed 18 days beyond the current date.
- **Request for Expedited Data** – When set to "yes," this indicates to ASTER that the user is requesting priority processing and shipping of image data collected for this DAR
- **Request for Direct Downlink** – NOT SUPPORTED BY ASTER
- **Justification for Direct Downlink** – NOT SUPPORTED BY ASTER
- **Apply –** Apply the changes made to the DAR display.
- **Dismiss –** Dismiss or ignore the changes made to the DAR display
- **Help –** Display a Help dialog explaining fields and buttons on the screen.

Table 4.12.11-10. Special Request Field Description

Field Name	Data Type	Size	Entry	Description
"Requester Comments" text field	Character	256	Optional	Allows user to provide information to the scheduler that supports requests for higher priority in the scheduling or processing of DAR data.
"Justification for Expedited Data" text field.	Character	256	*Required	If the user sets the "Request for Expedited Data" radio box to "yes," then an entry in the "Justification for Expedited Data" text field is required.

Resource Estimate

The Resource Estimate option, displayed on a read-only dialog that is enabled by a pushbutton located on the Create/Edit Request Tab, executes an algorithm that estimates the number of good scenes that will be returned from the xAR request in progress. This estimate is calculated by request when the use depresses the "**Resource Estimate**" button found on the "Create/Edit Request" tab of the DART main window and is based on the spatial and temporal parameters for the DAR that have been specified by the user. The user must specify an Area of Interest and a xAR Lifetime before the DART can calculate a resource estimate. The result of the calculation is displayed in an information dialog that is dismissed by the user after viewing the result by pressing "**OK**."

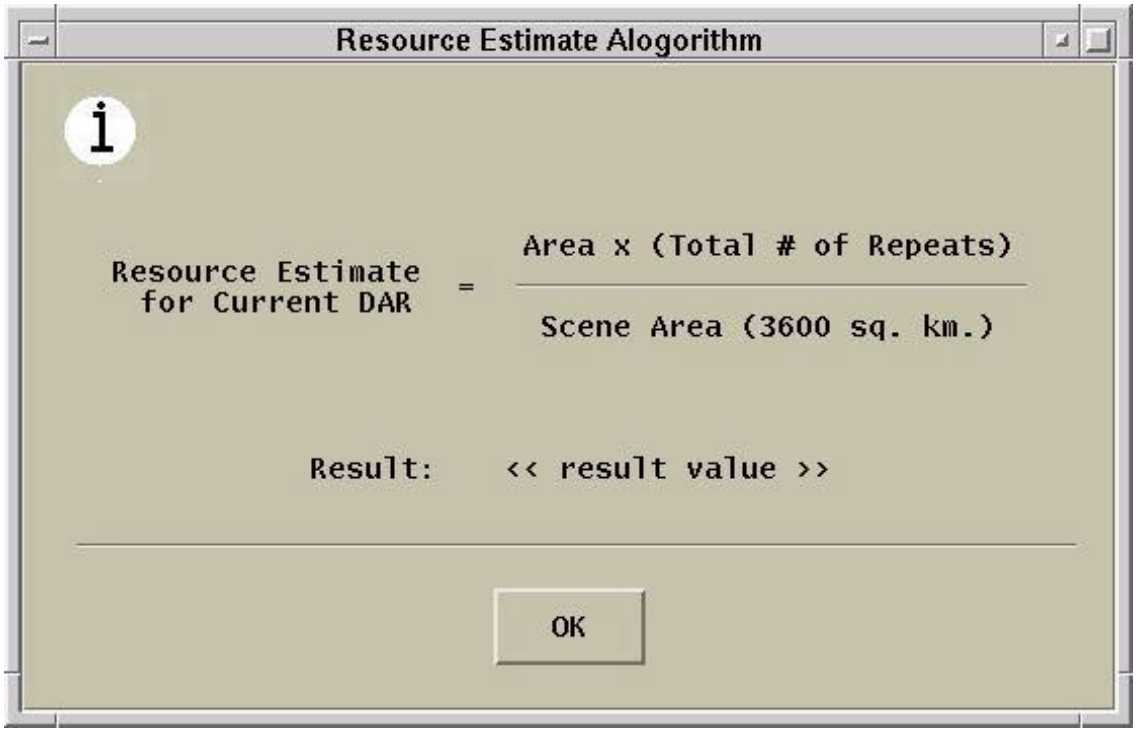

Figure 4.12.11-11. The "Resource Estimate" Pop-up.

Submit

When the user has completed setting all required DAR parameters (xAR Information, Spatial requirements, and Temporal Requirements), depressing the "**Submit**" button on the DART "Create/Edit Request" tab causes the DAR request to be sent to ASTER GDS. If the request is successfully received, a unique identification number, called a DAR ID will be returned to the user from ASTER GDS approximately 15 seconds later. This DAR ID is shown to the user in an information dialog.

4.12.11.2.2.2 Modifying a DAR

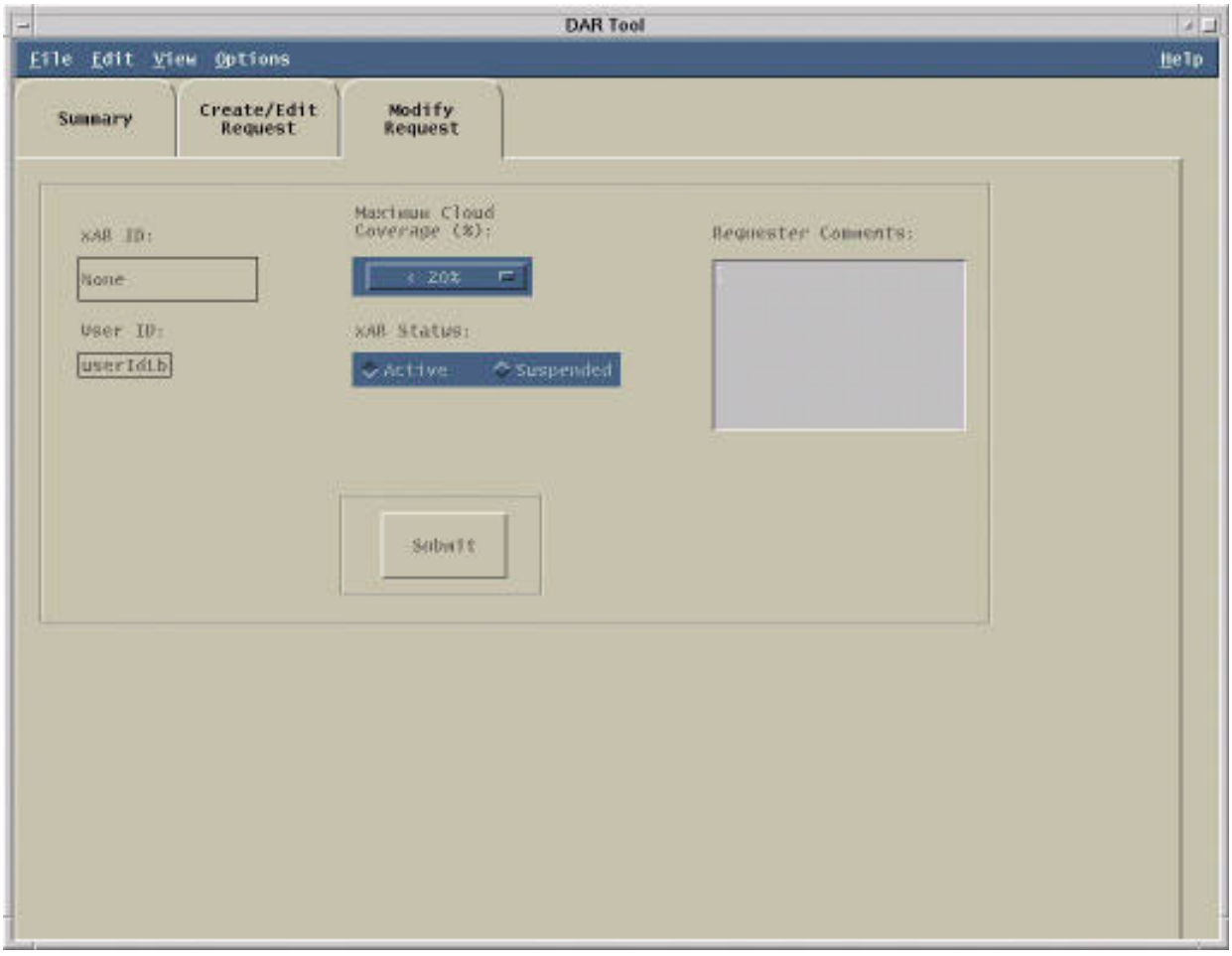

Figure 4.12.11-12. DART Main Screen showing the DART Modify Request Tab

Once a DAR is submitted to ASTER GDS and a DAR ID returned, the user can modify one of two parameters. The user can change "Acceptable Cloud Coverage" to a setting that is less restrictive than the original DAR request. The user can also change "xAR Status" – this means suspending an active DAR or re-activating a suspended DAR.

When a DAR ID is returned and the DAR is loaded into the DART, the user can go the "Modify Request" tab (located on the DART main window), change one or both of the two modifiable DAR parameters, and then "Submit" the modification.

The user should not be able to perform a "**Submit**" action from the "Modify Request" tab if either:

1. One no change has been made

2. The modifications(s) have been submit already.
3. Attributes other that the “modifiable” ones have been edited elsewhere in the DAR tool.

4.12.11.3 Required Operating Environment

Dart requires Sun Solaris 2.5.1. For information on the operating environment, tunable parameters and environment variables of DART see Appendix A.

4.12.11.4 Databases

The DART stores the information received through the GUI in the user’s home directory. This information will be available on subsequent DART sessions if the user chooses to modify the request for re-submission. Data used to create the mapping displays is stored in a proprietary database that is not accessible to DART users, the ESRI Mapping Tool.

4.12.11.5 Special Constraints

None.

4.12.11.6 Outputs

The output of the DART are data requests in xAR file format and the information displayed on the DART screens. A copy of the generated request is stored in the user’s home directory. If the user activated the “**Submit”** button a copy of the request is sent to the ASTER GDS.

4.12.11.7 Event and Error Messages

The DART issues error messages to indicate that a problems has occurred. There are two types of error messages. One type is a user message that indicates to the user that an invalid entry has been made by the user and should be changed before the Data Acquisition Request can be submitted. Other error messages are of the type that may require operator or technical support. Error messages produced by DART are listed in Appendix B.

4.12.11.8 Reports

None.

This page intentionally left blank.